

## CLAIMS

### What is Claimed is:

1. A startup code for protecting a shelled computer program, comprising:  
a sequence of tasks collectively executing the startup code; and  
5 wherein at least one task is selectably performed by a selected one of a plurality  
of task code variations as selected by a selection code associated with the at least one  
task.
2. The startup code of claim 1, wherein the selected one of the plurality task  
10 code variations is pseudorandomly selected.
3. The startup code of claim 1, wherein the selected one of the plurality of  
task code variations are selected based on a function of time.
- 15 4. The startup code of claim 1, wherein the selected one of the plurality of  
task code variations is selected based on a function of one or more parameters describing  
a computer executing the startup code.
5. The startup code of claim 4, wherein the one or more parameters  
20 includes a computer fingerprint.
6. The startup code of claim 1, wherein a second task of the sequence of  
tasks is selectably performed by a selected one of a plurality of second task code  
variations as selected by a second selection code associated with second task.  
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7. The startup code of claim 1, wherein a second task of the sequence of  
tasks is selectably performed by a selected one of a plurality of second task code  
variations as selected by a second selection code associated with the selected task code  
variation.  
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8. The startup code of claim 7, wherein the selected one of the plurality of  
second task code variations is pseudorandomly selected.

9. The startup code of claim 7, wherein the selected one of the plurality of second task code variations is selected based on a function of time.

10. The startup code of claim 7, wherein the selected one of the plurality of second task code variations is selected based on a function of one or more parameters describing a computer executing the startup code.

11. The startup code of claim 10, wherein the one or more parameters includes a computer fingerprint.

12. A startup code for protecting a shelled computer program, comprising:  
a plurality N of startup code tasks  $T_1, T_2, \dots, T_N$  to be performed to execute the startup code;  
a plurality K of startup task code variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$  for at least one  $T_i$  of the plurality startup code tasks  $T_1, T_2, \dots, T_N$ ; and  
a selection routine  $S_i$  for the at least one  $T_i$  of the plurality of startup code tasks  $T_1, T_2, \dots, T_N$ , the selection routine  $S_i$  for selecting at least one  $T_{ij}$  of the K plurality of code variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$  from among the plurality of code variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ .

13. The startup code of claim 12, wherein the startup code tasks are to be performed in series.

14. The startup code of claim 12, wherein the selection routine pseudorandomly selects the one of the plurality of code variations from among the plurality of code variations.

15. The startup code of claim 12, wherein the selection routine selects one of the plurality of code variations from among the plurality of code variations according to a function of time.

16. The startup code of claim 12, wherein the selection routine selects one of the plurality of code variations from among the plurality of code variations according to a function of one or more parameters describing a computer executing the startup code.

5 17. The startup code of claim 16, wherein the one or more parameters includes a computer fingerprint.

18. The startup code of claim 12, further comprising:  
a plurality K of second selection routines  $S_{i+1,1}, S_{i+1,2}, \dots S_{i+1,K}$  each second selection  
10 routine  $S_{i+1,1}, S_{i+1,2}, \dots S_{i+1,K}$  associated with and executed after one of the plurality of  
startup code variations  $T_{i,K}$ , and each second selection routine  $S_{i+1,1}, S_{i+1,2}, \dots S_{i+1,K}$  for  
selecting at least one of a plurality of L second startup code variations  $T_{i+1,1}, T_{i+1,2}, \dots,$   
 $T_{i+1,L}$ , for a second startup code task  $T_{i+1}$  of the plurality of startup code tasks  $T_1, T_2, \dots,$   
 $T_N$ .

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19. The startup code of claim 18, wherein each of the plurality of second selection routines pseudorandomly selects the one of the plurality of second startup code variations from among the plurality of second startup code variations.

20 20. The startup code of claim 18, wherein each of the plurality of second selection routines selects one of the plurality of second startup code variations from among the plurality of second startup code variations according to a function of time.

21. The startup code of claim 18, wherein each of the plurality of second  
25 selection routines selects one of the plurality of second startup code variations from among the plurality of second startup code variations according to a function of one or more parameters describing a computer executing the startup code.

22. The startup code of claim 21, wherein the one or more parameters  
30 includes a computer fingerprint.

23. A method of generating a secure startup code for use in generating a shelled application program, comprising the steps of:
- generating a plurality N of startup task routines  $T_1, T_2, \dots, T_N$  collectively forming the startup code;
  - 5 generating a plurality K of startup task routine variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$  for a chosen startup task routine  $T_i$  of the startup task routines  $T_1, T_2, \dots, T_N$ ;
  - generating a selection routine  $S_i$  for the chosen startup task routine  $T_i$  of the startup task routines  $T_1, T_2, \dots, T_N$ , each selection routine  $S_i$  for selecting at least one of the startup task code variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$  to perform the chosen startup task
  - 10 routine  $T_i$ ; and
  - assembling the secure startup code as a combination of the plurality of task routines  $T_1, T_2, \dots, T_N$  for the unchosen ones of the plurality of task routines, and the selection routine  $S_i$  and plurality of task routine variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$  for each of the chosen task routine  $T_i$  of the plurality task routines  $T_1, T_2, \dots, T_N$ .
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24. The method of claim 23, further comprising the step of separating the startup code into a series of task routines  $T_1, T_2, \dots, T_N$ .
25. The method of claim 23, wherein the selection routine  $S_i$
- 20 pseudorandomly selects the one of the plurality of startup task routine variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ .
26. The method of claim 23, wherein the selection routine  $S_i$  selects the one of the plurality of startup routine variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$  as a function of time.
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27. The method of claim 23, wherein the selection routine  $S_i$  selects the one of the plurality of startup routine variations  $T_{i,1}, T_{i,2}, \dots, T_{i,K}$  as a function of one or more parameters describing a computer executing the startup code.
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28. The method of claim 27, wherein the one or more parameters includes a computer fingerprint.

29. The method of claim 23, wherein:

the method further comprises the steps of generating a plurality K second selection routines, each second selection routine  $S_{i+1,1}, S_{i+1,2}, \dots, S_{i+1,K}$  associated with and executed after one of the plurality of startup code variations  $T_{i,K}$ , and each second  
5 selection routine  $S_{i+1,1}, S_{i+1,2}, \dots, S_{i+1,K}$  for selecting at least one of a plurality of L second startup code variations  $T_{i+1,1}, T_{i+1,2}, \dots, T_{i+1,L}$  for a second startup task routine  $T_{i+1}$  of the plurality of startup task routines  $T_1, T_2, \dots, T_N$ ; and

the secure startup code is assembled as a combination of the plurality of task routines for the unchosen ones of the plurality of task routines  $T_1, T_2, \dots, T_N$ , the  
10 selection routine  $S_i$  and plurality of task routine variations  $T_{i,1}, T_{i,2}, \dots, T_{i,L}$  for each of the chosen ones of the task routines  $T_1, T_2, \dots, T_N$ , and the second selection routines  $S_{i+1,1}, S_{i+1,2}, \dots, S_{i+1,K}$  and second startup code variations  $T_{i+1,1}, T_{i+1,2}, \dots, T_{i+1,L}$ .

30. A method of executing a secure startup code, comprising the steps of:

15 selecting a startup task code variation from among a plurality of startup task code variations, each startup code task variation performing a startup code task differently than the other startup code task variations, the startup code task belonging to a sequence of startup code tasks collectively performing the startup code; and  
executing the selected startup task code variation.

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31. The method of claim 30, wherein the startup task code variation is pseudorandomly selected.

32. The method of claim 30, wherein the startup task code variation is  
25 selected based on a function of time.

33. The method of claim 30, wherein the startup task code is selected as a function of one or more parameters describing a computer executing the startup code.

30 34. The method of claim 33, wherein the one or more parameters includes a computer fingerprint.

35. The method of claim 30 above, further comprising the steps of:  
selecting a second startup task code variation from among a plurality of second  
startup task code variations, each second startup code task variation performing a second  
startup code task differently than the other second startup code task variations, the  
5 second startup code task belonging to the sequence of startup code tasks collectively  
performing the startup code; and  
executing the selected second startup task code variation.

36. The method of claim 35, wherein the step of selecting the second startup  
10 task code variation is performed by executing a selection routine associated each of the  
startup code task variations and the second startup code task variations.

37. The method of claim 35, wherein the step of selecting the second startup  
task code variation is performed by executing a selection routine associated with the  
15 selected startup task code variation and the second startup task code variations.